HERBS OF CARAKA'S LEKHANĪYA MAHĀKAṢĀYA – IDENTIFICATION & CLINICAL RELEVANCE

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Abstract

Caraka classifies the therapeutic measures under six categories which are popularly known as *Ṣaḍūpakrama* i.e. *Lañghana*, *Bṛṃhaṇa*, *Rūkṣaṇa*, *Sehana*, *Svedana* and *Sthaṃbhana*. A person who is having proper knowledge of these six measures alone should be designated as *Vaidya*. Those *Upakramās* are indicated in the management of diseases which are mainly classified into two categories i.e. *Santarpaṇajanya Vyādhi* and *Apatarpaṇa janita Vyādhi. Lañghana*, *Rūkṣaṇa* and *Svedana* measures are mainly employed to treat *Santarpaṇajanya Vikārās*. Among the three also "*Lañghana*" is given top priority (*Śastamullekhanam*). *Caraka Saṃhitā* provides fifty pharmaco-therapeutic groups of drugs which are helpful in planning these *Upakramās. Lekhanīya* and *Bṛṃhaṇīya Mahākaṣāyās* of *Caraka* play pivotal role in planning *Upakramās* while treating *Santarpaṇaja* and *Apatarpaṇaja Vyādhīs* respectively. *Lekhanīya* drugs act on metabolic residual matter (*Malās*) by absorbing the liquid portion and scrape out the remnants clinging to *Srotas.* Among *Mahākaṣāya* of *Lekhanīya* drugs, *Haimavatī* (*Sveta Vacā*) appears to be of doubtful identity. Most of the scholars prefers to suggest Iris germanica as the source plant which is native of Italy and Morocco. Another plant Iris ensata, indigenous to India may be considered as the botanical source for *Haimavati*.

Among *Santarpaṇa Nimittaja Rogās – Prameha* (urinary disorders including diabetes), *Āma Pradoṣaja Vyādhīs* (included auto-immune diseases), and *Atisthaulya* (obesity), *Srotolepa* (adhesions plaques of channels like atherosclerosis), *Kuṣṭha* (skin diseases), and *Prameelaka* (depression) are a few conditions in which *Lekhanīya Daśemāni* can play an important role in the therapeutic management. Research studies carried out with these drugs proved that they possess significant anti-inflammatory, hepatoprotective, hypolipidemic, hypoglycaemic and sedative properties. *Guggulu* is a proven drug for its significant anti-inflammatory and hypolipidemic actions. A pill can be developed with *Lekhanīya Daśemāni* for the management of auto-immune arthritic conditions, hypercholesteremia, metabolic syndrome and fatty liver disorders without *Guggulu* - NGAID (Non- Guggulu Anti-inflammatory Drug) by taking into the scientifically validated data presented through pre-clinical and clinical studies.

In view of controversy prevailing in the identification of botanical source of *Haimavatī*, another drug *Harītakī* which is acclaimed to be prime and broad-spectrum activity in the management of *Santarpaṇa janya Vyādhīs* may be preferred to *Sveta Vacā* (*Haimavatī*).

Introduction: *Caraka* described 500 decoctives (*Pañca Kaṣāya Śatāni*) and grouped them into 50 groups which are popularly known as *Mahākaṣāyās* or *Daśemāni* – each group consisting of 10 drugs[1]. Commenting on *Punarvasu Ātreyā's* opinion about quoting limited number of drugs in each group with

repeated drugs interpreted that – if one and same drug can cure many diseases, there is no need of explaining many drugs unnecessarily. In fact, it is much easier to explain a smaller number of drugs useful in different diseases than to explain many drugs, each useful in curing one single disease. The fifty groups are enough for guiding students of lower intelligence while wise can utilize them and improve and expand the list of drugs as per their necessity and suitability. All the treatment modalities are classified into six broad measures referred as *Ṣaḍūpakrama* and all the diseases are categorized into two groups namely *Santarpaṇa Nimittaja Vyādhīs* (disease due to refreshing regimen) and *Apatarpaṇa Nimittaja* (diseases due to emaciating regimen). Among *Mahākaṣāyās* – *Lekhanīya Daśemāni* are indicated in the treatment of *Santarpaṇajanya Vikārās* while *Bṛṃhaṇīya Daśemāni* are prescribed for *Apatarpaṇajanya Vyādhīs.* Both the groups play an indispensable role in execution of *Lañghana* and *Bṛṃhaṇa Upakramās.*

Lekhanīya drugs (LD) are useful in the treatment of *Sanatarpaja Vyādhīs* namely *Prameha* (urinary diseases including diabetes), *Piḍakās* (carbuncles), *Pāṇḍu* (anaemia), *Kuṣṭha* (skin diseases), *Āma Pradoṣaja Vyādhi* (diseases due to *Āmaviṣa* including autoimmune disease conditions), *Mūtrakṛcchra* (dysuria), *Atisthaulya* (obesity), *Srotolepa* (adhesions / plaques in vessels), *Śopha* (oedema), *Buddhimoha* (delusion), and *Prameelaka* (restless, wavering, wondering, and depressive mind). *Carakās* list of LD are - *Mustā*, *Kuṣṭha*, *Haridrā*, *Dāruharidrā*, *Vacā*, *Ativiṣa*, *Kaṭurohiṇī*, *Citraka*, *Cirabilva* and *Haimavatī.* A careful review of research studies (preclinical and clinical) indicate that these drugs are useful in the treatment of diabetes, inflammatory conditions (joint and liver), hypercholesteremia, obesity, obstinate skin conditions, autoimmune diseases, and other conditions like metabolic syndrome.

Methods & Materials: Ayurvedic treatises, lexicons and research publications related to drugs of *Lekhanīya* group are consulted to formulate the concept of clinical application of these drugs and for developing a pill useful in treatment of diseases of *Māṃsa* and *Medo Pradoṣaja Nidāna.*

Out of 10 drugs of *Lekhanīya* group, the drugs namely *Mustā*, *Kuṣṭha*, *Ativiṣa*, and *Citraka* are enumerated in the *Agrauṣadhi* list and attributed *Dīpana*, *Pācana*, *Grāhī Karmās* and *Lekhanīya Karma* is not included. *Mustā*, *Citraka*, and *Ativiṣā* are the drugs may be useful to treat *Āma Pradoṣaja Vyādhīs* of *Santarpaṇajanya Vikārās. Vāgbhaṭa* identified the best *Prameha-hara* activity of *Haridrā*[2]. *Cakrapāṇidatta* mentioned *Vacā* as the best drug for treating severe and chronic *Apasmāra* and may be useful to treat *Buddhimoha* (delusion) and *Prameelaka* (wavering and depressive mind) of *Santarpaṇa* in origin. The definition of *Lekhanīya Karma* described by *Śāraṅgadhara* indicates that target areas are *Dhātu* (tissues), *Malās* (digestion and metabolic residues) and *Srotas* (vessels)[3]. The liquid portion of *Dhātūs* and *Malās* is first absorbed (*Śoṣaṇa*) and in the subsequent stage scrape out the residual portion (*Ullekhana*). Hot water, *Yava* and *Vacā* are quoted as examples. From this reference this is evident that *Vacā* is attributed with notable *Lekhanīya* property. The author of *Dhanvantarī Nighaṇṭu* (*Guḍūcyādi Varga*) quoted *Haimavatī* as one of the synonyms for *Harītakī* and attributed broad spectrum *Santarpaṇa-hara* activity. It may not be improper to consider *Harītakī* among *Lekhanīya Daśemāni* replacing *Sveta Vacā.*

Identification of drugs of Lekhanīya Mahākaṣāya: *Caraka* includes *Mustā*, *Kuṣṭha*, *Haridrā*, *Dāruharidrā*, *Vacā*, *Ativiṣa*, *Kaṭurohiṇī*, *Citraka*, *Cirabilva* and *Haimavatī* under *Lekhanīya Varga* among the 50 enumerated groups. A drug which causes lightness (*Lāghavakara*) in the body is defined as *Lañghana* (Ca. Sū. 22). The liquid content of *Dhātūs* and *Malās* involved in the pathogenesis of a disease is absorbed initially and left out residual material is scraped off by *Lekhanīya* drug. It consists *Vāyu* and *Agni* as the predominant *Mahābhūtās. Caraka* enumerated the imminent *Guṇās* involved in *Lañghana Upakrama* (measure) such as *Laghu*, *Uṣṇa*, *Tīkṣṇa*, *Viśada*,

Rūkṣa, *Sūkṣma*, *Khara*, *Sara*, and *Kaṭhina*. There are exceptions and certain drugs having these *Guṇās* may not contribute for *Lekhanīya* activity (eg. *Pippalī*). *Mustā* and *Kaṭurohiṇī*, which are possessing *Śīta Guṇa* are included in *Lekhanīya* group.

Mustā: Three varieties of *Mustā* are mentioned in various *Nighaṇṭūs* and the botanical source is established as

a) *Mustā* (*Piṇḍa Mustā*, *Bhadra Mustā*) – Cyperus rotundus
b) *Nāgaramustā* – Cyperus scariosus
c) *Kaivartamustā* – Cyperus tenuiflorus

Kuṣṭha: Saussurea lappa

Haridrā: Curcuma longa

Dāruharidrā: The wood of some species of Berberis, mostly B. aristata, B. asiatica, B. lyceum and B. vulgaris is considered as the source of *Dāruharidrā. Kāleyaka* (Coscinium fenestratum) which is marketed in South India may be considered as the substitute to Berberis aristata. *Dalhaṇa* has described it as similar to *Dāruharidrā* (*Dāruharidrānukarī Dravya*).

Vacā: *Dhanvantarī Nighaṇṭu* described two varieties of *Vacā*

a) *Vacā* – Acorus calamus

b) *Sveta Vacā* (white variety) which is also referred by another synonym namely *Hymavatī*[4].

The identity of *Sveta Vacā* is doubtful and some species of Iris such as Iris germanica (orris root), Iris nepalensis or Iris ensata may be its source. Iris germanica native of Italy and Morocco is an exotic plant and domesticated in India. It is being cultivated in Kashmir valley. But Iris ensata Thunb (Iridaceae) is the indigenous species often grown in the gardens of temperate north western Himalaya from Kashmir to Himachal Pradesh, may be considered as source plant of classical *Sveta Vacā* / *Haimavatī.*

Bhāvamiśra included three more varieties of *Vacā*[5].

a) *Mahābhārī Vacā* (*Sugandhi Vacā* or *Kulānjana*) – Alpinia galangal
b) *Sthūlagranthi Vacā* – Zingiber zerumbet
c) *Dvīpāntara Vacā* – Smilax china

Ativiṣā: Aconitum heterophyllum is well accepted as the source plant of *Ativiṣā* by majority of scholars. Another variety available in the market and used as *Ativiṣa* (*Atīsa*) is the tuber of A. palmatum which is elongated, harder and of blackish colour and may be considered as *Aruṇa* variety of *Ativiṣā.*

Citraka: One of the most important drugs is recognized on the basis of flower colour to be of three kinds i.e. *Pīta* (yellow), *Sita* (white), and *Asita* (non-white), *Vāgbhaṭa* considered *Asita* is the best among three. Plumbago zeylanica is considered as white flowered *Citraka* which mostly described in various *Nighaṇṭūs* and used in various formulations. Thakur Balwant Singh opines that "red flowered P. indica (P. rosea) may be considered as *Asita Citraka* and *Pīta Citraka* may be some hybrid form. *Kṛṣṇa* variety of *Nighaṇṭūs* may be the blue flowered *Citraka* i.e. Plumbago capensis[6].

Cirabilva: Dhanvantari Nighaṇṭu quotes synonyms like *Naktamālā*, *Cirabilva*, and *Pūtīka* for *Karanja* and *Ghṛtaparṇa*, *Prakīrya* and *Gauṣa* – synonyms for another variety of *Karanja.* A plant which is having foetid smell suits for Holoptelea integrifolia, while second variety i.e. *Ghṛtaparna* (glabrous leaf) may be accepted for Pongamia pinnata (Derris indica). The third variety known as *Udakīrya* which is also referred as *Mahā Karanja* and *Ṣaḍgrandhi* (six nodes) is yet to be identified. Holoptelea integrifolia is accepted as a botanical source of *Cirabilva* by majority of scholars.

Phytochemical Constituents of Lekhanīya Herbs[7]:

1. **Cyperus rotundus (Mustā):** The tuber is rich in copper (Cu), iron (Fe), magnesium (Mg), and nickel (Ni). β-Sitosterol, isolated from the tuber, exhibits significant anti-inflammatory activity. A triterpenoid constituent has been reported to show antipyretic, analgesic, and hypotensive effects. Sesquiterpenic compounds, such as isocyperol, play an important role in lipid metabolism through their lipolytic action, thereby helping to reduce obesity. The methanolic extract of the plant stimulates melanin production in cultured melanocytes. The alcoholic extract exhibits hepatoprotective activity against CCl_4-induced liver damage in mice.

Mustā (Cyperus rotundus)

2. **Saussurea lappa (Kuṣṭha):** The root contains essential oil and the alkaloid saussurine. Saussurine exhibits bronchodilator, anti-ulcer, and anti-anginal activities. The essential oil inhibits peristaltic movement of the gut. It is absorbed from the gastrointestinal (GI) tract and is partly excreted through the lungs, producing an expectorant effect, and partly through the kidneys, resulting in diuretic activity. It also shows strong antiseptic action against *Streptococcus* and *Staphylococcus* species.

   Roots obtained from Kashmir are generally richer in essential oil content than those from Garhwal, Punjab, and Nepal. Additionally, the Kashmir variety contains alantolactone, β-cyclocostunolide, and isoalantolactone.

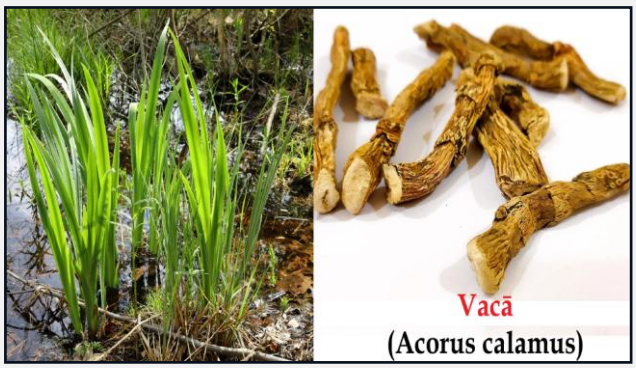
Kuṣṭha (Saussurea lappa)

3. **Curcuma longa (Haridrā):** The rhizome contains mainly curcumin and volatile oils. Curcumin interferes with cholesterol uptake and increases the conversion of cholesterol into bile acids and facilitates the excretion of bile acids via its choleretic activity. Curcuminoids prevent the increase of liver enzymes SGOT and SGPT and acts as a hepatoprotective drug. Curlone, obtained from dried rhizome is used against hepatitis. Curcumin increases the mucin content of stomach and exert gastro protective effect against stress, alcohol and drug induced ulcer formation. But in higher dose (100mg/Kg) exhibited ulcerogenic activity in rats. The ethanolic extract exhibited blood sugar lowering activity in alloxan – induced diabetic rats. Piperine (a constituent of black pepper and long pepper) enhances absorption and bioavailability of curcumin.

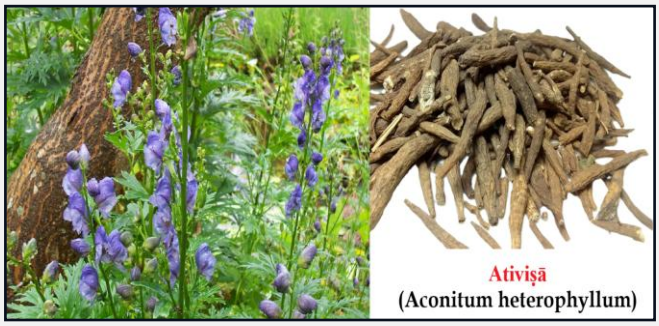
Haridrā (Curcuma longa)

4. **Berberis aristata (Dāruharidrā)** - It contains Berberine alkaloid which possesses antibacterial and anti-inflammatory activities. It also exhibits antineoplastic activity. It's synthetic derivative Dihydroberberine in used in Brain Tumours. Berberine has been found to inhibit the activity of enzyme trypsin and chymotrypsin in Vitro Studies. Berberine hydrochloride and sulphate help in the diagnoses of latent malaria.

5. **Acorus calamus (Vacā)-** The rhizome consists of **α-asarone (alpha-asarone)** and **β-asarone (beta-asarone)** and essential oil types I, II, III and IV types. The essential oil free alcoholic extract of A. calamus possesses sedative and analgesic activities. Alpha-asarone potentiates pento-barbital causing neurodepressive activity. (Sedative). Beta-asarone in carcinogenic in animals and reported as hallucinogenic. This report has impacted the usage of it in western countries. The ethanolic extract of rhizomes show significant anti-secretory and anti ulcerogenic activity, in experimental Studies. In type I essential oil beta-asarone and other phenylpropanoids are absent. It is proved superior in spasmolytic activity to the other types.



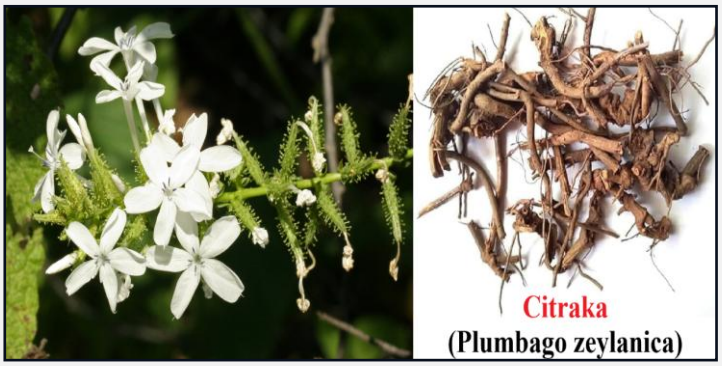
6. **Aconitum heterophyllum (Ativiṣā):** - The root yields approximately 0.79% total alkaloids, of which atisine constitutes about 0.4%. Atisine is significantly less toxic compared to aconitine and pseudoaconitine. The plant possesses potent immunostimulant properties.



7. **Picrorhiza kurroa (Kaṭurohiṇī):** The root Contains a glycosidal bitter principle, Kutkin, found to be a mixture of two glycosides Picroside I and Kutkoside. It also contains some more glycosides namely Cucurbitacin. and Androsin (phloroglucinol glycoside).Kutkin, Picroside I and Kutkoside exhibit anti-inflammatory property. Kutkin exhibited hepatoprotective activity in CCl_4-induced liver injury in rats. Picroliv, a standardized fraction from the alcoholic extract of root and rhizome,

containing a mixture of Picroside I and Kutkoside (1:15) showed hepatoprotective activity against thioacetamide-induced hepatic damage in rats and some isolated hepatocytes. It was found to be more potent than silymarin. It also exerts hypolipidemic effect in normal, triton treated and cholesterol -fed rats. Androsin prevents allergen and platelet activating factor induced bronchial obstruction in guinea - Pigs in Vitro.

8. **Plumbago zeylanica (Citraka):** The root contains naphthoquinone derivative - plumbagin. In experimental studies it is shown that plumbagin prevented the accumulation of triglycerides in liver and aorta and regressed atheromatous plaques. It showed significant antibacterial action against penicillin-resistant Neisseria Gonorrhoea. Plumbagin is also reported to behave like a spindle poison in lower doses and in higher concentration exhibits Cytotoxic and radiomimetic affects.



9. **Holoptelea integrifolia (Cirabilva):** The stem bark contains the triterpenoidal fatty acid esters, Holoptelin A & B, friedelin and epi-friedelinol. The powdered bark exhibited lipolytic action and mobilised fat from adipose tissue in rats and consequently helped in the reduction of obesity.

10. **Iris ensata & I. germanica (Haimavatī):** Arial parts of I. ensata contain xanthone glycosides, natural irones, phenolic acids and volatile oils. Root contains ceryl alcohol. I. germanica contains Triterpones, Beta sitosterol, beta - amyrin, irone, myristic, and iridal. The root extract of Iris species is used in cosmetic preparations for prevention of skin roughness.

Clinical Indication of Lekhanīya Group
[Ref. Bhāvaprakāśa Saṃhitā]

No.	Herb Name (Sanskrit/Latin)	Indications (Diseases / Conditions)
1	Mustā (*Cyperus rotundus*)	*Tṛṣṇā, Jvara, Aruci, Kṛmi*
2	Kuṣṭha (*Saussurea lappa*)	*Vātarakta, Visarpa, Kāsa, Kuṣṭha*
3	Haridra (*Curcuma longa*)	*Tvakdoṣa, Prameha, Asṛk roga, Śotha, Pāṇḍu, Vraṇa*
4	Dāruharidrā (*Berberis aristata*)	*Netraroga, Karṇaroga, Āsya roga* (in addition to indications of *Haridrā*)
5	Vacā (*Acorus calamus*)	*Vibandha, Ādhmāna, Śūla, Apasmāra, Unmāda, Kṛmiroga*
6	Ativiṣā (*Aconitum heterophyllum*)	*Atīsāra, Āmaviṣa, Kāsa, Chardi, Kṛmi*
7	Kaṭurohiṇī (*Picrorhiza kurroa*)	*Jvara, Prameha, Śvāsa, Kāsa, Asṛk roga, Dāha, Kuṣṭha, Kṛmi.*
8	Citraka (*Plumbago zeylanica*)	*Grahaṇī, Kuṣṭha, Śotha, Arśas, Kṛmi, Kāsa.*
9	Cirabilva (*Holoptelea integrifolia*)	*Chardi, Arśas, Kṛmi, Kuṣṭha, Prameha.*
10	Haimavatī (*Iris ensata & I. germanica*) –	*Vātaroga* and indications mentioned for *Vacā*

The *Lekhanīya* group of drugs are mainly employed in the clinical conditions related to *Tvak, Rakta* and *Medo Doṣās* like *Koṣṭa, Prameha, Vātarakta* and *Śotha*. *Ativiṣā* is mainly indicated in *Āmaviṣa* which may affect the immunity leading to auto immune diseases. These drugs are employed in the conditions involving *Rasa, Rakta, Māṃsa* and *Medo Dhātūs* due to *Santarpaṇajanya Vyādhīs*. *Lekhanīya Karma's* specific *Adhiṣṭhānās* are *Māṃsa* and *Medo Dhātūs* and *Pradoṣaja Vyādhīs* related to these *Dhātūs* may be managed with *Lekhanīya Mahākaṣāyās*. In current clinical practice these drugs can be applied judiciously in the management of metabolic syndrome, Fatty liver diseases, Diabetes, Ischemic Heart diseases with dyslipidaemias, auto-immune skin, and joint diseases.

Conclusion:

1. The drugs with *Lekhanīya* activity play an important role in the management of *Santarpaṇajanya* disease like Diabates, Heart diseases due to hyperlipidaemia, Fatty liver diseases, Obesity and inflammatory diseases involving skin and joints.
2. *Caraka* furnished *Lekhanīya Mahākaṣāya* (*Daśemāni*) which contain 10 drugs. *Mustā, Kuṣṭha, Haridrā, Dāruharidrā, Vacā, Ativiṣa Kaṭurohiṇī, Citraka, Cirabilva* and *Haimavatī*. Among these drugs *Haimavatī* often interpreted as *Sveta Vacā* is a controversial drug and can be replaced by *Harītakī* which is also referred by the synonym *Haimavatī* and attributed with *Lekhanīya* property. *Harītakī* is referred as prime drug to treat *Santarpaṇajanya Vyādhi*.

3. *Guggulu* (Commiphora mukul) is a proven drug with significant anti-inflammatory, anti-obesity and hypercholesteraemic

activities and several Ayurvedic Pharma companies are marketing several formulations with exorbitant prices[8]. *Lekhanīya Daśemāni* drugs are scientifically well validated for multiple activities can be combined to formulate a pill called Non Guggulu Anti-inflammatory Drug (NGAID) to manage the different disease conditions like dyslipidaemia, hyperglycaemia, fatty liver, obesity, metabolic syndrome and other inflammatory conditions and auto-immune disorders.

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